Cont'd SubD1

forming a first layer of a base metal a semiconducting material or as a combination of a base metal and a semiconducting material,

depositing a second layer of a conducting polymer on the first layer, said conducting polymer being selected among conducting polymers with a work function greater than the work function of the first layer, such that the real work function of the electrode structure in any case becomes equal to the work function of the selected conducting polymer, and providing the electrode structure in the semiconducting device such that the second layer contacts at least a portion of an active organic semiconductor material in said semiconducting device,

Cont C1

modifying the work function of the conducting and/or semiconducting material of the first layer by depositing a second layer of a conducting polymer with a work function higher than that of the material in the first layer such that the layer of the conducting polymer mainly covers the first layer or is conformal with the latter, whereby the combination of the first layer and second layer constitutes the anode of the electrode arrangement and the work function of the anode becomes substantially equal to that of the conducting polymer,

depositing a third layer of semiconducting organic material on top of the anode, and optionally and in case only a portion of the substrate is covered by the anode, also above at least some of the portion of the substrate not covered by the anode, and

depositing a patterned or non-patterned fourth layer of a metal on the tope of the third layer, whereby the fourth layer constitutes the cathode of the electrode arrangement.

5. A method according to claim 1, wherein depositing the second layer is performed by depositing the second layer as a dispersion from a dispergent or as a dissolved material from a solution.

6. A method according to claim 1, wherein depositing the second layer is performed by depositing the second layer in a melt application process.

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7. A method according to claim 1, wherein the step of depositing the second layer selects the conducting polymer in the second layer as a doped conjugated polymer.

8. A method according to claim 7, wherein the conjugated polymer among poly(3,4-dioxyethylene thiophene) (PEDOT), a copolymer which includes the monomer 3,4-dioxyethylene thiophene; substituted poly(thiophenes), substituted poly(pyrroles), substituted poly(anilines) or copolymers thereof.

9. A method according to claim 7, wherein the step of depositing the second layer selects the dopant for the conjugated polymer as poly(4-styrene sulphonate) (PSS).

10. A method according to claims 7, wherein the step of depositing the second layer selects as the doped conjugated polymer poly(3,4-ethylenedioxythiophene) (PEDOT) doped with poly(4-styrene sulphonate) (PSS).

11. A method according to claim 1, wherein the step of depositing the third layer selects the semiconducting organic material in the third layer among conjugated polymers, or crystalline, polycrystalline, microcrystalline and amorphous organic compounds.

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12. A method according to claim 11, wherein the step of depositing the third layer selects the conjugated polymer in the third layer among poly(2-methoxy, 5-(2'-ethylhexyloxy)-1,4-phenylene vinylene) (MEH-PPV) or poly(3-hexylthiophene) (P3HT).

13. A method according to claim 18, wherein the step of depositing the fourth layer selects the metal of the fourth layer among metals which have a lower work function than that of the anode.

14. A method according to claim 13, wherein the step of depositing the fourth layer selects the metal of the fourth layer as the same as the metal selected for the first layer.

15. A method according to claim 14, wherein the step of depositing the fourth layer selects aluminum as the metal of the fourth layer.

Please add the following claims:

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--18. A method for the fabrication of an organic thin-film rectifier diode with high rectification ratio, wherein the rectifier diode comprises a first layer and a second layer provided on the first layer, such that the first and the second

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layers together form the anode of the rectifier diode, a third layer of a semiconducting organic material provided over the anode, such that the third layer forms the active semiconductor material of the diode, and a fourth layer of metal provided patterned or unpatterned over the third layer, such that the fourth layer forms the cathode of the rectifier diode, and wherein the method comprises :

Cont. C2

depositing the first layer in the form of a base metal or an inorganic semiconductor or a combination of a base metal and an inorganic semiconductor on an insulating substrate, said first layer being deposited patterned or unpatterned such that at least a portion of the substrate is covered thereby, and

depositing the second layer in the form of a conducting polymer over the first layer such that the second layer wholly or partly covers the first layer, said conducting polymer being selected as a conducting polymer with the work function equal to or greater than the work function of the first layer, whereby the work function of the anode in any case becomes equal to the work function of the conducting polymer.

19. A method according to claim 18, wherein said step of depositing the first layer selects the metal of the first layer among calcium, manganese, aluminum, nickel, copper or silver.

Cont. C8

20. A method according to claim 1, wherein the step of depositing the first layer selects the inorganic semiconducting material of the first layer among silicon, germanium or gallium arsenide.

21. A method according to claim 19, wherein only a portion of the substrate is covered by the anode, further comprising,

depositing the third layer over at least a part of the portion of the substrate which is not covered by the anode.--